

Aug 1, 2011

Dear U.S. Federal Communications Commission,

The FCC should not grant LightSquared permission to use the Mobile Satellite Services (MSS) spectrum (L1 Band 1 MSS (1525 MHz-1559MHz)) adjacent to GPS for high-powered terrestrial transmissions. The Global Positioning System (GPS) is a vital part of the US national infrastructure and is used for many civilian and defense applications. GPS has recently emerged as a powerful and relatively inexpensive approach to measure the global atmosphere and ionosphere for operational weather, climate research, and space weather applications. A new application of GPS, called the GPS radio occultation (RO) limb sounding technique, uses a GPS receiver on a low Earth orbit (LEO) satellite to receive GPS signals as they are occulted by the Earth's atmosphere. These signals are used to profile temperature, pressure and moisture in the lower atmosphere and electron density in the ionosphere. Data from the Constellation Observing System for Meteorology, Ionosphere & Climate (COSMIC) mission, a U.S. RO constellation of six low-Earth orbit satellites launched in 2006, is having tremendous operational and scientific impact on society. For example, all major numerical weather prediction centers, including NCEP, USAF Weather Agency, ECMWF, UK Met Office, Météo France, Meteorological Service of Canada, Japan Meteorological Agency, and Taiwan's Central Weather Bureau are now assimilating COSMIC GPS RO data into their operational global models and are all reporting significant positive impacts on forecasts. Additionally, GPS RO data are improving forecasts of Hurricane track and intensity, which is limiting the economic impact of these severe weather events. The success of COSMIC has prompted the U.S. NOAA to initiate plans for a COSMIC follow-on mission (called COSMIC-2) that will put twelve satellites with GNSS (Global Navigation Satellite System) RO payloads into orbit on two launches in the 2015-17 time frame.

The operational and scientific value of COSMIC-2 GPS RO data over CONUS will be seriously degraded if LightSquared is granted permission by the FCC to transmit in the proposed L bands adjacent to the GPS L1 band. The degradation, ranging from reduction of signal-to-noise (SNR) to loss of lock, will occur over regions with dense network of LS ground transmitters (i.e. mainly over the continental US). This, in turn, will result in the increase of errors of the retrieved meteorological parameters and reduction of the number of useful profiles. Simulation analyses have determined the percentage of time space-based RO measurements could be disrupted was as high as 12% globally, and would be significantly higher when the spacecraft is in view of the United States (Assessment of LightSquared Terrestrial Broadband System Effects on GPS Receivers and GPS-dependent Applications, National Space-Based Positioning, Navigation, and Timing Systems Engineering Forum (NPEF), June 1, 2011). LightSquared transmissions will severely degrade the operational and scientific utility of GPS RO observations over the US, and thus permission for LightSquared to transmit in the proposed bands should not be approved by the FCC.

Thank you.

Sincerely,

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